

14.12 ROUGH RUNNING OR STALLING

There are several causes for rough running or stalling. These probable causes are:

- ☐ Low Battery Voltage
- ☐ Aerated Fuel
- ☐ Insufficient Fuel Flow

14.12.1 Troubleshooting Procedure for Low Battery Voltage

To determine if a weak battery is causing rough running or stalling, perform the following steps:

**CAUTION:**

To avoid injury from battery explosion or contact with battery acid, work in a well-ventilated area, wear protective clothing, and avoid sparks or flames near the battery. Always establish correct polarity before connecting cables to the battery or battery circuit. If you come in contact with battery acid:

- ☐ Flush your skin with water.
- ☐ Apply baking soda or lime to help neutralize the acid.
- ☐ Flush your eyes with water.
- ☐ Get medical attention immediately.

**CAUTION:**

To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.

**CAUTION:**

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

- ☐ Always start and operate an engine in a well ventilated area.
- ☐ If operating an engine in an enclosed area, vent the exhaust to the outside.
- ☐ Do not modify or tamper with the exhaust system or emission control system.

1. Start and run the engine.
2. Measure the battery voltage; refer to OEM guidelines.
 - [a] If the battery voltage is greater than or equal to 10.5 volts, check for aerated fuel; refer to section 14.12.3.
 - [b] If the battery voltage is less than 10.5 volts, replace the battery; refer to section 14.12.2.

14.12.2 Battery Replacement

Perform the following steps for battery replacement:

1. Remove and replace the battery; refer to OEM guidelines.

2. Verify battery replacement; refer to section 14.12.2.1.

14.12.2.1 Test Engine with Replaced Battery

Perform the following steps to determine if the battery replacement resolved the concern:

 CAUTION:

To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.

 CAUTION:

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- ☐ **Always start and operate an engine in a well ventilated area.**
- ☐ **If operating an engine in an enclosed area, vent the exhaust to the outside.**
- ☐ **Do not modify or tamper with the exhaust system or emission control system.**

1. Start and run the engine.
2. Run the engine at idle with a no-load condition for approximately five minutes, allowing the engine coolant to reach normal operating range, 88–96°C (190–205°F).
 - [a] If the engine is not running rough or stalling, no further troubleshooting is required. Shut down the engine.
 - [b] If the engine is running rough or stalling, shut down the engine. Check for aerated fuel; refer to section 14.12.3.

14.12.3 Troubleshooting Procedure for Aerated Fuel

To determine if aerated fuel is causing rough running or stalling, perform the following steps:

1. Disconnect the fuel line return hose from the fitting at the fuel tank; refer to OEM guidelines.
2. Place the open end of the fuel line into a suitable container.

**CAUTION:**

To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.

**CAUTION:**

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

- ☐ Always start and operate an engine in a well ventilated area.
- ☐ If operating an engine in an enclosed area, vent the exhaust to the outside.
- ☐ Do not modify or tamper with the exhaust system or emission control system.

3. Start and run the engine.
4. Operate the engine at 1000 rpm.
5. Visually check to see if air bubbles are rising to the surface of the fuel within the container.
 - [a] If air bubbles are present, shut down the engine; refer to section 14.12.4.
 - [b] If air bubbles are not present, shut down the engine. Check for high fuel temperature return, which would be an indication of insufficient fuel flow.

14.12.4 Aerated Fuel Resolution

Perform the following steps to resolve aerated fuel:

1. Tighten all fuel line connections between fuel tank and fuel pump; refer to OEM guidelines.
2. Visually inspect all fuel lines for leaks between fuel tank and fuel pump.
3. Repair damaged components as required; refer to OEM guidelines.
4. Verify aerated fuel resolution; refer to section 14.12.4.1.

14.12.4.1 Test the Engine with Aerated Fuel Resolution

Perform the following to determine if aerated fuel resolution has resolved rough running or stalling condition:

⚠ CAUTION:

To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.

⚠ CAUTION:

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

- ☐ Always start and operate an engine in a well ventilated area.
- ☐ If operating an engine in an enclosed area, vent the exhaust to the outside.
- ☐ Do not modify or tamper with the exhaust system or emission control system.

1. Start and run the engine.
2. Run the engine at idle with a no-load condition for approximately five minutes, allowing the engine coolant to reach normal operating range.
3. Test for rough running condition.
 - [a] If the engine appears normal, no further troubleshooting is required. Shut down the engine.
 - [b] If the engine is still running rough, shut down the engine. Check for insufficient fuel flow to nozzle holder assemblies.

14.12.5 Troubleshooting Procedure for Insufficient Fuel Flow

To determine if insufficient fuel flow is causing rough running or stalling, do the following steps:

1. Perform a fuel flow test. Measure fuel return flow rate at the bypass valve location.
2. Analyze the fuel flow test results.
 - [a] If the fuel rate is 0.9 L/min. (0.2 gal/min.) or more, no further troubleshooting is required. Contact Detroit Diesel Technical Service.
 - [b] If the fuel rate is less than 0.9 L/min. (0.2 gal/min.), resolve the insufficient fuel flow; refer to section 14.12.6.

14.12.6 Insufficient Fuel Flow Resolution

Perform the following steps to resolve the insufficient fuel flow:

1. Replace the fuel filter(s); refer to section 2.14.1.

NOTE:

Always fill the filter(s) with clean fuel oil before installing. Turn the filter(s) until they contact the gasket fully. Then, turn them an additional two-thirds by hand.

2. Inspect the fuel lines for restrictions due to pinching, kinking, or other damage. If damage is found, repair as necessary; refer to OEM guidelines.
3. Inspect the fuel return check valve for restrictive movement.
4. Inspect the fuel pump drive assembly. If damage is found, repair as necessary; refer to section 2.15.
5. Verify repairs done to correct insufficient fuel flow; refer to section 14.12.6.1.

14.12.6.1 Test the Engine with Resolved Fuel Flow

Perform the following steps to determine if the fuel flow resolution resolved rough running or stalling:

**CAUTION:**

To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.

**CAUTION:**

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

- ☐ **Always start and operate an engine in a well ventilated area.**
- ☐ **If operating an engine in an enclosed area, vent the exhaust to the outside.**
- ☐ **Do not modify or tamper with the exhaust system or emission control system.**

1. Start and run the engine.
2. Run the engine at idle with a no-load capacity for approximately five minutes, allowing the engine coolant to reach normal operating range, 88–96°C (190–205° F).
 - [a] If the engine is not running rough or stalling, no further troubleshooting is required. Shut down the engine.
 - [b] If the engine is running rough or stalling, shut down the engine. Contact Detroit Diesel Technical Service.